

August 21, 2012

TO: Members of the MAG POPTAC Ad Hoc Subcommittee

FROM: Patrick Banger, Chair

SUBJECT: TRANSMITTAL OF MEETING NOTICE AND TENTATIVE AGENDA

Tuesday, August 28, 2012 – 9:30 a.m.
MAG Office, Second Floor, Chaparral Room
302 North 1st Avenue, Phoenix

A meeting of the MAG Population Technical Advisory Committee (POPTAC) Ad Hoc Subcommittee will be held at the time and place noted above.

Members of the subcommittee may attend either in person or by telephone conference call. If you are attending via audio conference please contact Steve Gross at (602) 254-6300 at least one day prior to the meeting.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Anubhav Bagley at the MAG office. Requests should be made as early as possible to allow time to arrange the accommodation.

Please be advised that under procedures approved by the MAG Regional Council on June 26, 1996, all MAG committees need to have a quorum to conduct business. A quorum is a simple majority of the membership or 4 people for the MAG POPTAC Ad Hoc Subcommittee. If you are unable to attend the meeting, please make arrangements for a proxy from your jurisdiction to represent you. If you have any questions or need additional information, please contact Anubhav Bagley at (602) 254-6300.

TENTATIVE AGENDA
MAG Population Technical Advisory Committee
August 28, 2012

1. Call to Order

2. Call to the Audience

An opportunity will be provided to members of the public to address the MAG POPTAC on items not scheduled on the agenda that fall under the jurisdiction of MAG, or on items on the agenda for discussion but not for action. Members of the public will be requested to limit their comments to three minutes. A total of 15 minutes will be provided for this agenda item, unless the Chair of the POPTAC provides for an exception to this limit. Those wishing to comment on action agenda items will be given an opportunity at the time the item is heard.

3. Approval of Meeting Minutes of June 26, 2012.

4. Assumptions for MAG Socioeconomic Projections

The MAG Socioeconomic projections are based on model assumptions. These assumptions and methods are essential to the AZ-SMART model system and include, but are not limited to: special populations (e.g. group quarters, seasonal, transient), airport originations, school enrollment (K-12 and post high school). The MAG POPTAC Ad Hoc Subcommittee will be requested to recommend approval of the assumptions. Please see attachment One.

2. For information.

3. For information, discussion and approval of the minutes of June 26, 2012.

4. For information, discussion and possible recommendation to MAG POPTAC to approve the assumptions for the preparation of the 2012 MAG Socioeconomic Projections.

MINUTES OF THE
MARICOPA ASSOCIATION OF GOVERNMENTS
POPULATION TECHNICAL ADVISORY COMMITTEE AD HOC SUBCOMMITTEE

June 26, 2012
MAG Offices, Chaparral Room
302 N. 1st Ave, Phoenix

MEMBERS IN ATTENDANCE

Charlie McClendon, Avondale, Vice Chair

*Wahid Alam, Mesa

Robert Yabes for Lisa Collins, Tempe

A-David de la Torre, Chandler

A-Adam Yaron, Scottsdale

Thomas Ritz, Glendale

*Matt Holm, Maricopa County

*Chris DePerro, Phoenix

**Those members neither present nor represented by proxy.*

A - Participated via audioconference

OTHERS IN ATTENDANCE

Eric Morgan, Avondale

Scott Wilken, MAG

Steve Gross, MAG

Anubhav Bagley, MAG

Jesse Ayers, MAG

Mark Roberts, MAG

1. Call to Order

Vice Chair Charlie McClendon called the meeting to order at 9:09 a.m.

2. Call to the Audience

There were no requests from the audience to address the MAG POPTAC Ad Hoc Subcommittee.

3. Approval of Minutes of November 1, 2011

It was moved by Thomas Ritz, seconded by Robert Yabes and unanimously recommended to approve the meeting minutes of November 1, 2011.

4. Assumptions for MAG Socioeconomic Projections

Jesse Ayers presented the methods and assumptions used in Arizona's Socioeconomic Modeling, Analysis, and Reporting Toolbox (AZ-SMART) to prepare the 2012 MAG Socioeconomic Projections. He said that this presentation is the first of two presentations on AZ-SMART. He said this presentation will focus on assumptions that will be used to create the base year data, and the second part, which will be presented in August, will focus on the simulation itself. He said that the presentation will cover nine topics, six of which the Ad Hoc sub-committee will be asked to recommend to the full POPTAC.

Jesse Ayers said that the first topic, for information and discussion only, is about the official geographies to be used by the model. He said that AZ-SMART models down to the parcel level, and can aggregate data back up to any level of geography. He said that the data is officially released at three levels of geography: Regional Analysis Zones (RAZ), Transportation Analysis Zones (TAZ), and Municipal Planning Area (MPA).

Jesse Ayres said that AZ-SMART requires a detailed base-year database, down to the micro level. He said that starts with a record for each parcel of land, and then records associated with the parcels, including built space information and occupant information. He said that many different datasets and tools were used to create the base-year data, and one of the main tools is called PopGen. He said that PopGen is capable of generating person and household records and attaching them to a geography. He said that to assist with the base data, staff created Pseudo Block Groups, which are a combination of Census Place and Census Block Group.

Thomas Ritz noted that it seems that staff is taking data from the American Community Survey (ACS) 2006-2010 and squeezing it into the block groups from the 2010 Census and the July 1, 2010 population estimates, which would include information from as far back as 2006. Anubhav Bagley said that some of the necessary data is only available from the ACS, and the 2006-2010 survey is the latest information available. He said that Pseudo Block Groups were created because Census Block Groups do not aggregate to Census Places, and ACS data is only available by Census Block Group. Thomas Ritz asked if a Census Block Group that is totally within a Census Place boundary would be modified into a Pseudo Block Group. Anubhav Bagley said that it would not be modified. Thomas Ritz asked if Pseudo Block Groups are generally the same size as Census Block Groups. Anubhav Bagley said that they are, with the exception of when Census Block Groups cross Census Place boundaries.

Jesse Ayers said similar information is needed for the base employment dataset, starting with the parcel, and including non-residential built space on each parcel, and how many jobs occupy each record of built space. He said that this information largely comes from the MAG Employer Database, which is matched up with some outside data sources. Thomas Ritz asked if the work-at-home (WAH) and non-site-based (NSB) job points have been mapped. Anubhav Bagley said that staff took the employer database and identified the large employers that were located on residential property and adjusted as necessary for businesses with more than 2 employees. Robert Yabes asked what the maximum number was for home employment. Anubhav Bagley said that the cap was 2 employees.

Robert Yabes asked, on the residential base data, when block groups were divided, what characteristics were used to determine where to reallocate population. Anubhav Bagley said that the persons per household characteristics came from the block data, but data that came from the ACS, like income groups, number of children and workers, had to be assumed was shared across the block group.

Jesse Ayers said that AZ-SMART needs county-level control totals for each projection year to know what population and employment totals to match. He said that the population control totals come from the State Demographer using an annual cohort-component model. He said that the employment control total comes from Moody's Economy.com. Anubhav Bagley said that staff will take a population-to-jobs ratio from the Moody's data, and scale it to match the population projections from the State Demographer to join the two projection series together. Robert Yabes asked if there is any bias in that method. Anubhav Bagley said that it's not that it's biased, but it's the only way to tie the two series together. He said that usually in comparison, the differentials aren't very big.

Jesse Ayers said that staff supplied two different classification tables in the handout: building types and employment sectors. He said there will be more in the next presentation, but these two are the most relevant to the base-year data creation.

Jesse Ayers discussed the land use databases. He said that the Existing Land Use (EXLU) establishes areas that have been developed and areas that are to be developed. He said that the General Plan Land Use (GPLU) tells the model what is to come on the areas to be developed. He said that the Developments Database tells the model about developments that are to come at some known point in the future, with more detail than the GPLU. Anubhav Bagley said that any General Plan Amendments that come along in the next few months can be incorporated into the model.

Jesse Ayers discussed some assumptions made as part of the residential projection process. He said that density factors determine the capacity of land. As an example he said that General Plans provide density estimates that help establish carrying capacity of parcels of land. He said that staff has compiled a TAZ-based persons per household database. He said that vacancy rates are used throughout the data preparation process, the establishment of build-out estimates, and the projections process for residential. He said that staff has examined historical single-family to multi-family ratios to see how that has changed over time, which is one of the comparisons that can help determine if the model is on the right track. He said that the MAG transportation modelers are interested in age-restricted communities, and staff looked at those at a TAZ level.

Jesse Ayers discussed assumptions made as part of the employment projections process. He said to determine employment density an analysis of floor-area ratios (FAR) was done by land use type. He said staff also did an analysis of square feet per job for different job types using the built space database and the employer database. He said this will help determine future vacancy rates and when a non-residential building is at its full employment capacity. He said staff acquired non-residential vacancy rates from COSTAR. Anubhav Bagley said

that staff is looking at historic vacancy rates for residential and non-residential to ensure that any current anomalies are not relied on for future projections.

Jesse Ayers discussed build-out analysis methodology. He said that staff created base and build-out population, housing, and employment figures and reviewed them with member agencies.

Robert Yabes made a motion to recommend to the MAG POPTAC approval of the AZ-SMART assumptions and methodologies for the 2012 socioeconomic projections. David de la Torre seconded the motion and the motion passed unanimously.

The meeting adjourned at 10:02 am.

Assumptions and Methods of MAG Socioeconomic Projections 2012

Part 2

Introduction

The purpose of this document is to detail the methodologies, assumptions, analyses, data collection activities, and data sources to be used in developing a base year database, build-out analysis, and housing, population, and employment projections. This year MAG staff will make use of a brand new model system specifically developed for the MAG region: Arizona's Socioeconomic Modeling Analysis and Reporting Toolbox, hereinafter referred to by its acronym, AZ-SMART. AZ-SMART is a complex model system that requires many more data inputs and assumptions. This document represents part 2 of a short series of documentation on the methods and assumptions in the simulation system.

This document is organized into 5 topics, each briefly summarized below:

1. Group Quarters Population

This section describes the 5 general categories of the group quarters population, the assumptions made in the projection of the totals of group quarters, and the methods by which these annual totals are allocated to sub-county geographies. It is requested that POPTAC members approve these methodologies.

2. Airport Originations

This section describes the 2 major airports that originations are projected for, the sources for the projections, and how the totals are allocated between the airports. It is requested that POPTAC members approve these methodologies.

3. Seasonal Population

This section describes seasonal populations, where they reside, how the annual totals are projected, and how the totals are allocated to sub-county geographies. It is requested that POPTAC members approve these methodologies.

4. Transient Population

This section describes transient populations, where they reside, how the annual totals are projected, and how the totals are allocated to sub-county geographies. It is requested that POPTAC members approve these methodologies.

5. School Enrollment

This section describes a new methodology for kindergarten through 12th grade school enrollment projections, along with a methodology for post secondary school enrollment. Both "top down" and "bottom up"

Assumptions and Methods of MAG Socioeconomic Projections 2012

methodologies are described and compared. It is requested that POPTAC members approve these methodologies.

I. Group Quarters

All residents not living in households are classified as living in group quarters. Population in group quarters is a part of the socioeconomic projections required by MAG transportation models. Methods for projecting the different components of population in group quarters (military quarters, prisons and jails, college dormitories, nursing homes, and other group quarters) have been identified by MAG Consultants¹. The base year group quarters population is based upon the results of the 2010 Census and the group quarter inventory prepared by MAG Staff and reviewed by POPTAC previously.

- **Military group quarters population.** Military group quarters population is held constant at the current population of Luke Air Force Base at the recommendation of a Consultant¹. MAG Staff contacted a Luke Air Force Base representative to confirm the latest population of 927.
- **Prison and jail population.** Prison and jail population is projected as a percentage of the population in the age cohort of 20-44, increasing slightly throughout the projection horizon. Based on analysis of historical Census data by a Consultant¹ it is recommended that a slight increase in the factor be applied throughout the projection horizon as follows:
 - In simulation years 2010 through 2019, the percentage is 1.4%.
 - In simulation years 2020 through 2029, the percentage is 1.6%
 - In simulation years 2030 through 2040, the percentage is 1.8%

During the simulation model run, the percentage of the population is calculated, then it is proportionally allocated to existing prison and jail sites in Maricopa County based on the current size of each facility. If a new prison or jail site is included in the simulation as a known development, the model will include that site in the allocation. The simulation model does not predict new prison and jail facilities, however.

- **College dormitory population.** College dormitory population is calculated as a percentage of the population in the age cohort 18 through 19. This percentage is held at a constant 11% throughout the forecasting horizon of 2040 at the recommendation of a Consultant¹. During the simulation model run, the percentage of the population is calculated, it is then proportionally allocated to existing dormitory sites based on their size. If new dormitory sites are included in a known development in a later simulation year, the model will include those sites in the allocation. The simulation model does not predict new dormitory sites, however.
- **Nursing home population.** Nursing home population is calculated as a percentage of the population in the age cohort 75 and older. An analysis of historical Census data by a Consultant¹ indicated a slow but steady downward trend since 1980. The pace of the decline slowed between 2000 and 2010 (0.7 percentage points) compared to the previous decade (3.4 percentage points). The consultant recommended that we trend the 2010 rate downward at a decreasing rate. To this end, the percentage decreases slightly throughout the projection horizon.
 - In simulation years 2010 through 2019, the percentage is 3.9%.
 - In simulation years 2020 through 2029, the percentage is 3.76%

Assumptions and Methods of MAG Socioeconomic Projections 2012

- o In simulation years 2020 through 2029, the percentage is 3.732%

During the simulation model run, the percentage of the population is calculated, then this total is proportionally allocated to existing nursing home sites based on their size. If new nursing home sites are included in a known development in a later simulation year, the model will include those sites in the allocation. The simulation model does not predict new nursing home sites, however.

- **Other group quarters population.** Other group quarters population, such as group homes, is calculated as a percentage of the entire population. At the recommendation of a Consultant¹, the percentage is held at a constant 0.3% throughout the projection horizon of 2040. During the simulation model run, the percentage of the population is calculated, then this total is proportionally allocated to existing other group quarters sites based on their size. If new other group quarters sites are included in a known development in a later simulation year, the model will include those sites in the allocation. The simulation model does not predict new other group quarters sites, however.

POPTAC Ad-Hoc Recommendation Requested: Approval of methodology to produce Group Quarters population variables for the 2012 official projections.

2. Airport Originations

Daily airport originations are required as part of the MAG transportation model for the 2 major airport sites in the region: Sky Harbor Airport in Phoenix, AZ and Phoenix-Mesa Gateway Airport in Mesa, AZ. Projections of flight originations for every 5 years from 2010 through 2050 were obtained from the respective airports master plans. Annual flight originations for both airports were calculated from every 5 year numbers using a simple linear interpolation methodology. The originations are simply assigned to the respective airport location in the simulation model. The simulation model does not predict new airport locations.

POPTAC Ad-Hoc Recommendation Requested: Approval of methodology to produce Airport Origination variables for the 2012 official projections.

3. Seasonal Population

Seasonal population is defined as residents of the area for two weeks to six months and is a part of the socioeconomic projections required by the MAG transportation models. An inventory of mobile home parks and RV parks was created to gather information on location and characteristics of the parks, expansion plans, as well as the number and types of residents during peak and low seasons. Seasonal residents are divided into 3 categories for projections, namely those residing in single and multiple family housing units (SFMFS), mobile homes (MHS) and RV parks (RVS). The inventory of mobile home and RV parks was last reviewed and updated by MAG member agencies in July 2012.

- To calculate base year seasonal households and population by unit type (SFMFS, MHS, RVS), we start with the total units by type from the 2010 Census (SFMFS and MHS) and use the MAG RV database for RVS. We then apply the seasonal vacancy rate by type from the Census to arrive at a total number

Assumptions and Methods of MAG Socioeconomic Projections 2012

of seasonal households. Then a constant 1.9 persons per household is assumed to estimate the seasonal population in the base yearⁱ.

- Using information from the MAG General Plan, multi-family/single-family percentages are calculated for future years. Also, due to economic conditions, the 2010 vacancy rates are assumed to be too high, so using the recommendation of our consultant, we adjust the overall seasonal and non seasonal rates down to a more normal 3.9% and 5.5% (respectively) by 2015 using a linear interpolation. These rates are held constant from 2015 to the end of the forecast horizon.
- The vacancy rates and multi-family/single-family splits are used to forecast seasonal and non-seasonal units by type in the future simulation years
- In the future simulation years, seasonal population and households by unit type are estimated from the exogenous forecast of total population, using the above calculated and adjusted vacancy rates by unit type.
- The seasonal population forecast totals by unit type are then proportionally allocated to seasonal units annually in the simulation modelⁱ.

POPTAC Ad-Hoc Recommendation Requested: Approval of methodology to produce Seasonal population variables for the 2012 official projections.

4. Transient Population

Transient population is defined as residents of the area for two weeks or less and is a part of the socioeconomic projections required by the MAG transportation models. To estimate transient population, an inventory of hotels, motels, and resorts was created to gather information on their location, number of rooms, occupancy, expansion plans, and information on new facilities. The inventory was last reviewed and updated by MAG member agencies in July 2012. Current data on visitor statistics and projections were obtained from the Arizona Office of Tourismⁱⁱ to produce base transient population.

Transient Population is tightly correlated with employment and spending in the Accommodation and Food Services and Leisure and Hospitality sectors of the county economy. A Consultant recommended that we base our methodology for generating future control totals on projections of employment. Using data obtained from the Arizona Office of Tourism and projections of employment from Moody's Economy.com, the following factors are used: 14 million annual overnight visitors to Maricopa County, staying an average of 3.5 nights, with an average party size of 1.2 (increasing linearly to 2.6 in 2015, held constant thereafter), with a 63%/37% split between stays in hotels and other locations respectively.

- First, average daily visitors are calculated by dividing annual visitors (14 million) by the average daily stay (3.5). This number is then split using the aforementioned percentages to get a hotel and other locations split.
- The 14 million annual visitors is increased over time in proportion to the total employment in the aforementioned sectors of the economy, giving us increasing totals for future allocation.

Assumptions and Methods of MAG Socioeconomic Projections 2012

- Then for the future average daily visitors, we apply the same methodology to compute the base year splits by hotels and other locations.
- During the simulation, transient population projections at the county level are proportionally allocated to the hotel, motel, resort, and other sites based on their respective size. If the known developments dataset contains a new hotels, motels, or resorts, the allocation model will take those new sites into account. The simulation model does not predict new transient population sites.

POPTAC Ad-Hoc Recommendation Requested: Approval of methodology to produce Transient population variables for the 2012 official projections.

5. School Enrollment

For the first time, MAG staff will be forecasting both Post-Secondary school enrollment and K-12 school enrollment by school site as required by the MAG transportation models. An inventory of both K-12 and post secondary school sites was created to gather information on location, student capacity, and any expansion plans. A preliminary K-12 inventory was created for the projections, and the post secondary inventory will be reviewed by MAG member agencies in September 2012.

MAG Staff currently have 2 methodologies for projecting school enrollment: a “top down” approach and a “bottom up” approach. The top down methodology involves using the Census 2006-2010 ACS data and an older survey from ASU to calculate participation rates by age cohort by grade level, then holding these rates constant over the simulation horizon. The bottom up methodology involves using a newly created AZ-SMART model that predicts when a student will exit school and enter the workforce. A consultant developed this “bottom up” model and a set of rates (using the same 2006-2010 ACS data) by age cohort. As the simulation runs, the model annually, and randomly, selects a certain percentage of the population by age cohort to exit school and enter the workforce. MAG Staff are still evaluating the results of the new model at this time. In either case, the simulation uses the resulting totals and allocates them to the school locations based on the size of the institution. If the known developments dataset contains new school locations, the allocation model will take those new locations into account. The simulation model does not build new school locations at this time, however.

POPTAC Ad-Hoc Recommendation Requested: Approval of methodology to produce School Enrollment population variables for the 2012 official projections.

ⁱ Jeff Tayman, PhD. May 2011. Population, Housing Characteristics, Special Populations, and Employment: Data, Control Totals, and Allocation.

ⁱⁱ <http://www.azot.gov/research-and-statistics> (Last accessed 8/21/2012)